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FIRST AUSTRALIAN RECORDS OF THE FAMILY PISIONIDAE (POLYCHAETA), WITH THE DESCRIPTION OF A NEW SPECIES

by G. HARTMANN-SCHRÖDER* & S. A. PARKER†

Summary

HARTMANN-SCHRÖDER, G. & PARKER, S.A. (1990) First Australian records of the family Pisionidae (Polychaeta), with the description of a new species. *Trans. R. Soc. S. Aust.* **114**(4), 195–201, 30 November, 1990.

Material of two species of *Pisione* recently collected in Spencer Gulf, South Australia, constitutes the first Australian records of the Pisionidae, a family of small interstitial polychaetes. One of the species is *P. gopalai* (Alikunhi, 1941), known previously only from India, and here redescribed with additional observations concerning its reproductive system. The second species, apparently related to *P. papillata* Yamanishi, 1976 of Japan, is described as *P. tortuosa* sp. nov.

KEY WORDS: Polychaeta, Pisionidae, *Pisione gopalai*, *Pisione tortuosa* sp. nov., Australia.

Introduction

The family Pisionidae is widely distributed in warm temperate to tropical zones, with two species (*P. longipalpa* Uschakov, 1956 and *P. remota* (Southern, 1914)) occurring in cool temperate seas. Members of the family live interstitially, preferring sandy substrates in shallow waters from the intertidal to 78 metres.

Until recently, no pisionids had been known from Australia. During a benthic survey of upper Spencer Gulf, South Australia, conducted by the S. Aust. Fisheries Dept in 1986 and 1987, a total of 342 specimens of the genus *Pisione* was collected from nine stations by Smith-McIntyre grab. Of these, 338 proved referable to *P. gopalai* (Alikunhi, 1941), known previously only from India, and four represented an undescribed species related to *P. papillata* Yamanishi, 1976 of Japan. Below, *P. gopalai* is redescribed, and the second species is described.

Material and Methods

Measurements are in millimetres, made with an eyepiece micrometer. Drawings were made with the aid of a camera lucida on a Zeiss microscope. Material is deposited in the South Australian Museum, Adelaide (SAM), Zoological Museum, Hamburg (ZMH), Australian Museum, Sydney (AM) and National Museum of Natural History, Washington DC (USNM). The terminology for the general morphology mainly follows Southern (1914) and Yamanishi (1976); that for the reproductive structures follows Alikunhi (1941). Details of the collecting-stations are presented in Table 1.

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Systematics

Family PISIONIDAE Levinsen, 1887

Genus *Pisione* Grube, 1857

Pisione gopalai (Alikunhi, 1941)

FIGS 1–12

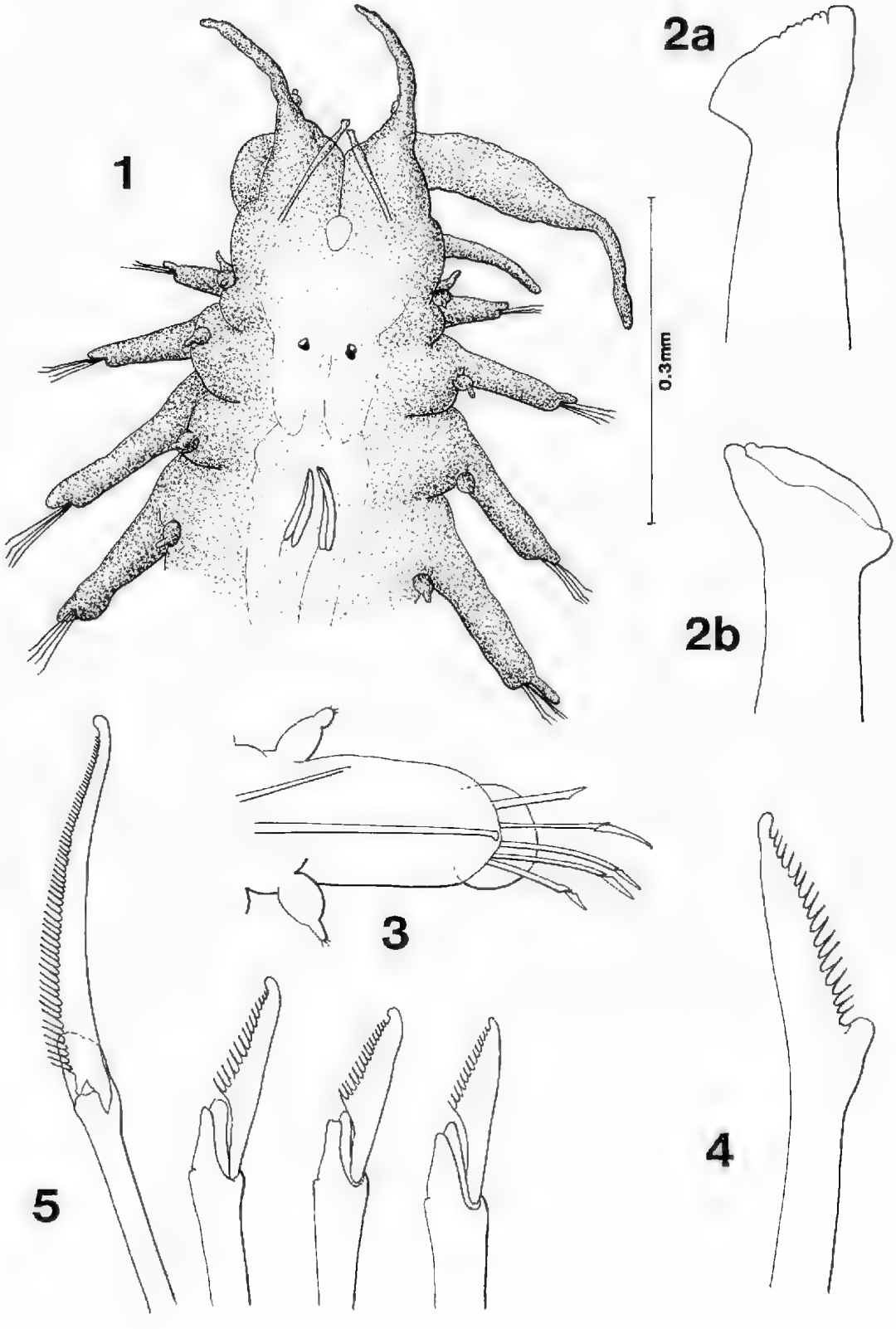
Praegeria gopalai Alikunhi, 1941: 224, pls 10, 11, text-figs 1–27.

Pisione gopalai: Alikunhi, 1951: 24–25; Rao & Ganapati, 1968: 110.

Material examined: Station 5, SAM E2328(1); Station 6, SAM E2329(60), ZMH P19699–19700(31), AM W20109(6), USNM 127193(6) (all from a single sample of 103), SAM E2330–2341(146); Station 7, SAM E2342(1); Station 8, SAM E2343–2344(7); Station 10, SAM E2345(1); Station 15, SAM E2346, E2365–2368(94), ZMH P19697–19698(6); Station 16, SAM E2369(1); Station 25, SAM E2370–2372(7); Station 30, SAM E2373(1).

Description of new material: Largest female 57 setigers, length 8.8. Largest male 55 setigers, length 6.1. Prostomium small, surrounded by buccal segment, palps long, dorsal cirri of buccal segment elongate, very weakly annulated, ventral cirri small, globular, each with terminal papilla, two pairs of eyes on posterior lobes of brain at level of second setiger (Fig. 1). Buccal aciculae strong, tips expanded, obliquely truncate with inconspicuous dentations (Figs 2a, b).

Dorsal cirri similar in form and size, short, globular, each with terminal papilla (Figs 1, 3). Ventral cirri of setiger 1 slightly elongated; ventral cirri of succeeding setigers short, globular (Figs 1, 3).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2a
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2b
3
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TABLE 1. *Details of Stations in Spencer Gulf at which pisionids were collected.*

Station	Lat. (S)	Long. (E)	Depth (m)	Sandgrain size
5	32°42′20″	137°47′26″	15	medium to coarse
6	32°45′00″	137°50′00″	16	coarse
7	32°47′18″	137°49′12″	15	coarse
8	32°47′18″	137°50′00″	11	coarse
10	32°50′00″	137°49′48″	11	medium
15	33°00′00″	137°00′00″	24	coarse
16	33°00′00″	137°49′52″	18	very coarse
25	33°02′24″	137°54′55″	12	coarse
30	33°05′00″	137°45′00″	16	medium

Parapodia elongate, truncate, each with large rounded presetal lobe and two aciculae, the upper short, the lower long and expanded distally (Fig. 3). Usually five setae per parapodium, one superior simple seta and four inferior compound falcigerous setae; simple seta stout, expanded distally with obliquely truncated, coarsely serrated tip (Fig. 4); uppermost compound seta with broad shaft and long serrated blade, inferior compound setae distally bifid with short serrated blades (Fig. 5).

Pygidium with two lateral groups of caudal glands and two long anal cirri (Fig. 6).

Reproductive System: Females. 24–57 setigers. Reproductive organs consist of 1–3 ovarian groups (Alikunhi (1941) mentioned only 1–2 groups), each extending into 5–16 consecutive segments (3–15 *fide* Alikunhi 1941), and 1–3 pairs of *receptacula seminis* corresponding to the ovarian groups and located in segment following each group. Parapodia of *receptacula seminis*-bearing segments greatly reduced, each with truncated lobes, one acicula, a dorsal cirrus and a genital papilla, last bearing common apperture of a *receptaculum seminis* and a nephridial duct (Figs 7, 8; see also Alikunhi 1941).

Of 117 females examined, 46 had one pair of *receptacula seminis*, which were located in setigers 17–45, mostly in setigers 25(5), 26(3), 27(4), 28(6) and 29(4); of these 46 specimens, 23 had 33–37 setigers. Fifty-one females had two pairs, in setigers 15–55; of these 51, 35 had 38–52 setigers. Seventeen females had three pairs, in setigers 20–53; of these 17, eight had 53–56 setigers.

Males. 21–55 setigers. Reproductive system usually consists of one pair of sperm sacs, a pair of genital funnels and a pair of copulatory organs; only one male (from SAM E2371) out of 166 males examined had two pairs of each of these structures. Parapodia of copulatory organ-bearing segment strongly modified (Figs 9–12): each parapodium ends in a papilla with stiff cuticular projections and a hook-like retractile process where efferent duct of sperm sac opens; posterior side of each parapodium also with a spinous papilla of unknown function and, more ventrally, a second process with cuticular projections (?modified ventral cirrus); dorsal cirrus, aciculae and presetal lobe of normal shape.

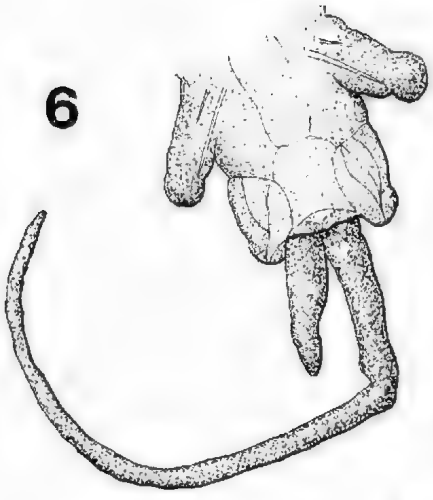
Copulatory organs located in setigers 15–26. Of 166 males examined, 33 had these organs in setiger 20, 30 had them in setiger 21, and 26 had them in setiger 22. In the first group, 15 specimens had 33–39 setigers, in the second group 15 had 37–40 setigers, and in the third group 13 had 36–41 setigers.

Juveniles and unsexed adults. Sixty unsexed specimens (with 9–37 setigers) were found. Most were juveniles, with fewer than 20 setigers. The other individuals might have been at a post-reproductive stage in which the reproductive organs had disintegrated and new parapodia had developed at the genital segments.

Distribution and habitat. India: Madras, Pathinettarayalom, Waltair Coast, in coarse sand of the lower intertidal; South Australia: Upper Spencer Gulf, in medium to very coarse sand of the benthos, 11–24 m.

Pisionids, being tiny and interstitial, can be easily overlooked, as demonstrated by the late discovery of this species and the next in Spencer Gulf, a relatively well-collected area. It is not unlikely, therefore, that other populations of *P. gopalai* remain to be discovered between India and Australia.

Figs 1–5. *Pisione gopalai* (Alikunhi, 1941). 1, anterior end (dorsal view); 2 a, b, buccal aciculae; 3, parapodium with globular dorsal and ventral cirri (posterior view); 4, superior simple seta; 5, compound setae.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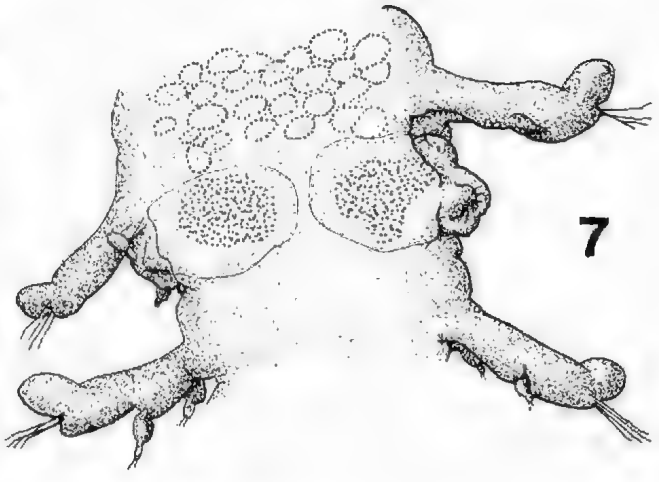
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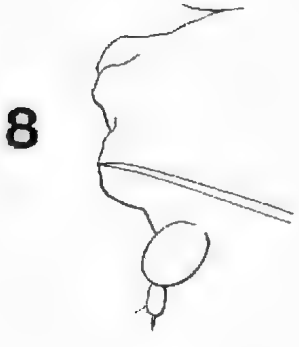
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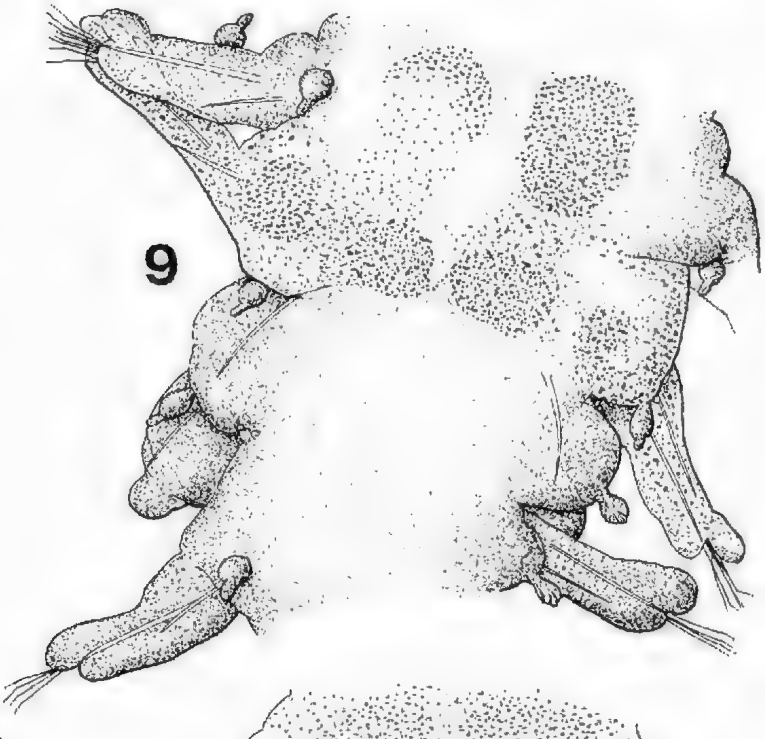
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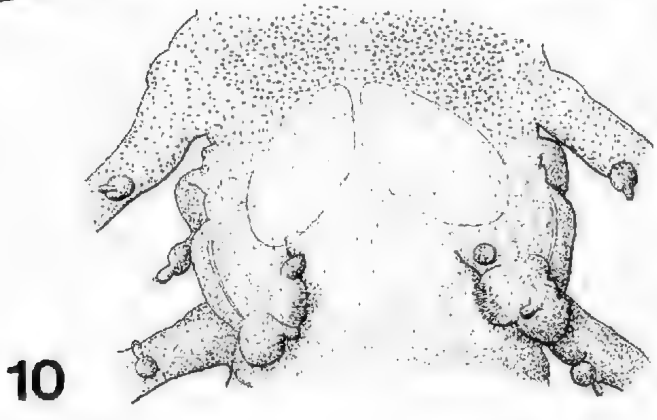
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Pisione tortuosa sp. nov.
FIGS 13–17

Holotype: SAM E2325, Station 15, 24 m, in coarse sand, upper Spencer Gulf, South Australia, collected by E. Oks, S. Aust. Fisheries Dept, Feb. 1986; 94 setigers, length 16.0, width (excluding parapodia) 0.35.
Paratypes: SAM E2326(1), E2327(1), ZMH P19369(1), same data as holotype; 72–86 setigers, length 12.0–13.2.

Definition: A *Pisione* with dorsal cirri on setiger 2 elongated and evenly tapering (lacking terminal papilla); eyes at level of setiger 1; lower acicula of each parapodium amber-coloured and straight; blade of uppermost compound seta twisted and long.

Description: Prostomium diamond-shaped, very small, surrounded by buccal segment; palps large, elongate; dorsal tentacular cirri thread-like, ventral one short, globular with terminal papilla; one pair of small eyes on brain at position of first setiger (Fig. 13). Buccal aciculae strong, distally expanded, obliquely truncate with indistinct serration (Fig. 14).

Parapodia (some partly separated from body due to fixation) oblong, bearing two presetal lobes, the upper one nearly rectangular, the lower a little longer, conical; and two aciculae, superior one smaller and pale, inferior one larger and amber-coloured (Fig. 15). Dorsal cirri (except those of setiger 2) short, globular; dorsal cirri of setiger 2 elongated, tapering, with no terminal papilla, but shorter than parapodial lobe (Fig. 13). Ventral cirri of first setiger also elongated, greatly exceeding parapodial lobe; other ventral cirri globular (Figs 13, 15).

Setae comprise one superior simple seta and four compound falcigerous setae (Figs 16, 17). Simple seta stout, distally obliquely truncate, with strong dentation. Uppermost compound seta much thinner, its shaft with asymmetrical oval end, the blade long, subdistally twisted, with coarse dentation. Shafts of the three inferior compound setae distally bifid; blades short, serrated.

Etymology. The name *tortuosa*, a Latin adjective, refers to the twisted blade of the uppermost seta.

Comparison with other species

Species of *Pisione* with elongate dorsal cirri on setiger 2 are *P. africana* Day, 1963, *P. crassa* Yamanishi, 1976, *P. oerstedii* Grube, 1857 (including *P. a. pulla* Westheide, 1974) and *P. papillata* Yamanishi, 1976. In *P. africana* the second dorsal cirrus is more slender than and twice as long as the others, though of the same shape (*i.e.* not tapering evenly but ending in a distinct papilla); in *P. crassa* and *P. oerstedii* all the compound setae have short blades.

The four specimens from Spencer Gulf appear most similar to *P. papillata* of Japan, but differ sufficiently to merit description as a separate species. The new species is larger, 12.0–16.0 in length as opposed to 'up to 7.6 mm' in *P. papillata* (Yamanishi 1976). In addition, the distal margins of the buccal aciculae are more sharply truncated, the eyes are at the level of setiger 1 rather than setiger 2, the lower acicula of each parapodium is amber-coloured and straight rather than pale and sharply recurved at the tip, and the blade of the uppermost seta is longer and twisted.

Distribution and habitat

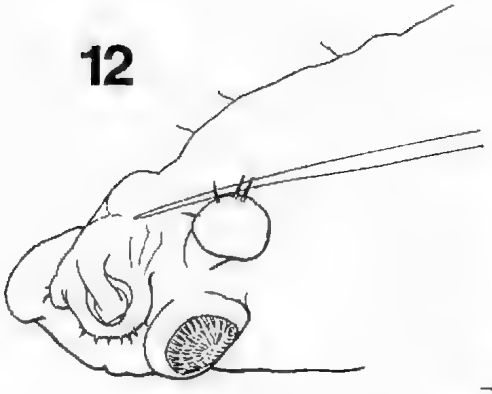
P. tortuosa is so far known only from the type-locality in upper Spencer Gulf, S.A., where it was collected at 24 m in coarse sand. The related *P. papillata* of Japan has been reported from beaches of coarse sand at Hon-jima on the island of Shikoku and Hishio on Honshu (Yamanishi 1976), localities on opposite shores of the Seto Naikai.

In Spencer Gulf, *P. tortuosa* appears less common and more localized than *P. gopalai*, having been found at only one station (four specimens), as against nine stations (338 specimens) for the latter.

Acknowledgments

We should like to thank Ms Ene-mai Oks, leader of the Spencer Gulf benthic survey, for lodging the survey's collections with the South Australian Museum, and Mr J. R. Hanley and Dr P. Hutchings for their criticism of the manuscript.

Figs 6–11. *Pisione gopalai* (Alikunhi, 1941). 6, pygidium (ventral view); 7, 8, reduced parapodium of segment bearing *receptacula seminis* (dorsal view); 9, 10, segments bearing copulatory organs (dorsal and ventral views respectively); 11, modified parapodium of segment bearing copulatory organs (anterior view).



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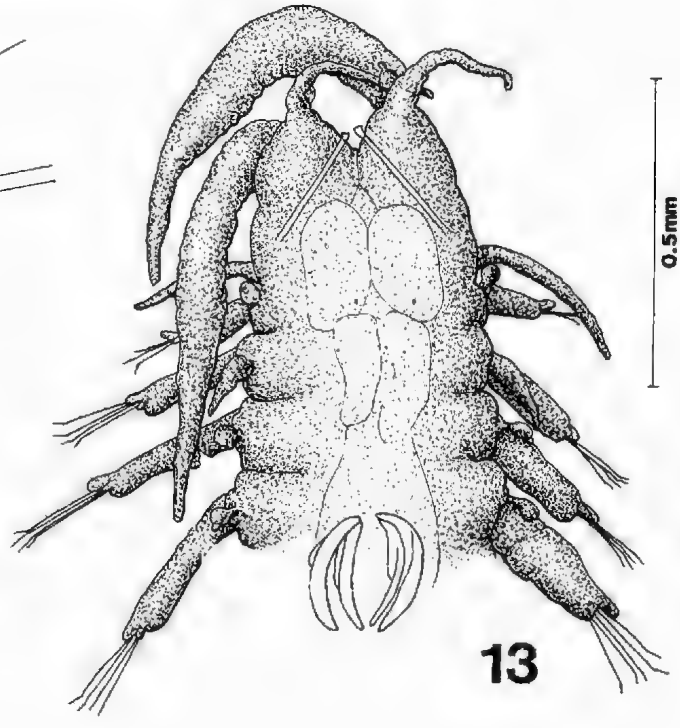

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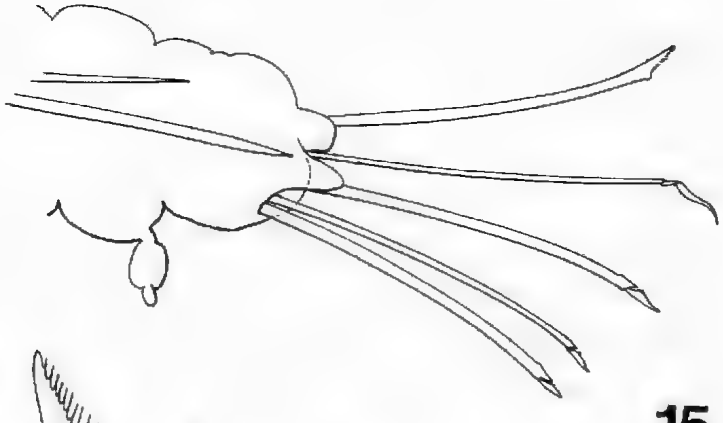

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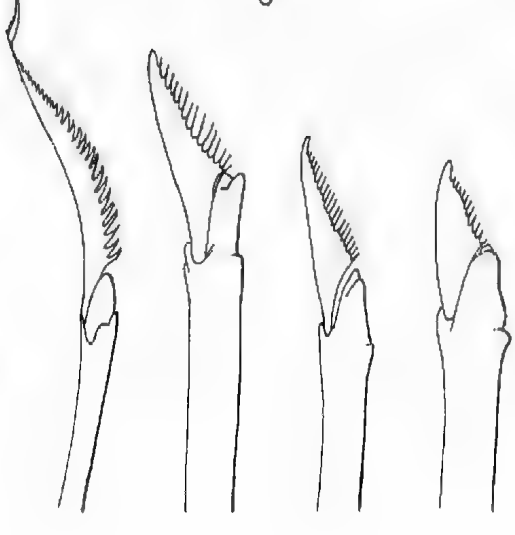

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Fig. 12. *Pisione gopalai* (Alikunhi, 1941). Modified parapodium of segment bearing copulatory organs (posterior view). (Figs 1–6, 9–12 from SAM E2365, figs 7, 8 from SAM E2329).

Figs 13–17. *Pisione tortuosa* sp. nov. SAM E2325: 13, anterior end (dorsal view) 14, buccal acicula; 15, parapodium (anterior view); 16, simple seta; 17, compound setae.

FIRST AUSTRALIAN RECORD OF *HESIONURA* (POLYCHAETA: PHYLLODOCIDAE), WITH THE DESCRIPTION OF' A NEW SPECIES

BY G. HARTMANN-SCHRÖDER & S. A. PARKER†*

Summary

A new species of phyllodocid polychaete, *Hesionura australiensis* sp. nov., is described from Spencer Gulf, South Australia. The single specimen, collected in coarse sand at a depth of 11 metres, represents the first record of the genus *Hesionura* Hartmann-Schröder, 1958, from Australia.

KEY WORDS: Polychaeta, Phyllodocidae, *Hesionura australiensis,* new species, Australia.